

Buprestidae.

- Thamnognatha bonvouloiri* Saund.
- " *chevrolati* Gehin.
- " *heros* Gehin.
- " *miszechi* Saund.
- " *yarrelli* var. *cleigans* Gehin.
- " *miranda* Cart.
- " *chaleodera* Thoms.
- " *gigas* Cart.
- " *parryi* var. *picea* Kerr.
- " *brueki* Thoms.
- " *oleata* Blkb.
- " *tibialis* Waterh. (many colour and pattern varieties.)
- " *rectipennis* Blkb.
- " *murrayi* Gem. & Har.

Scarabaeidae.

- Metallesthes metallescens* White (two varieties).
- Pocillocephala succinea* Hope.

Trogidae.

One large species.

ARACHNIDS

Centipedes were very prevalent and at the Mission often enter the houses. During our stay we found three in our house.

Many scorpion burrows were spread throughout the sandier parts. One dug up from a spiral burrow about two feet below the surface was a species of *Urodacus*.

THE BREEDING PERIODS OF THE BLACK CORMORANT

By D. L. SERVENTY, Nedlands.

When reviewing the nesting seasons of cormorants in South-Western Australia (1939, p. 368) I concluded, from the evidence then available, that all the species nesting in fresh-water localities bred in the spring months and that only the purely marine Pied Cormorant (*Phalacrocorax varius*) was an exception. This was shown to have a double nesting season, all of the colonies on the coastal islands breeding in the autumn and early winter while those on the isolated Abrolhos Islands bred in the late spring. Field and other evidence since then suggests that the Black Cormorant (*P. carbo*), nesting in fresh-water swamps, not only has a double nesting season in this State but the autumn nesting population is greater than that nesting in the spring.

The Black Cormorant is not a very abundant species in Western Australia and hitherto practically nothing has been recorded about its nesting habits. The only reference I can trace is that of A. J. Campbell (1901, p. 972), who recorded that Miss A. M. Ellis had made observations for him of a rookery of these birds on the lower

Blackwood River. A set of the eggs collected by her is now in the National Museum, Melbourne; date, August 21, 1889.

On June 12, 1951, Mr. C. F. H. Jenkins, Mr. T. Spence (then on a visit from England) and I discovered a nesting colony of Black Cormorants at Lake Coollelal, on the Wanneroo Road 10 miles north of Perth. We were watching Blue-billed Ducks on the occasion and our attention was attracted to the cormorants by seeing several individuals with conspicuous white thigh patches and white face markings flying low over the water in a northerly direction. When finally we saw some of them carrying long stieks and other nesting material we made as close an investigation as we could of the place where the birds were seen to land. This was the north end of the lake. It was not possible to wade thither but we made a careful examination with field glasses from vantage points on the bank. Altogether 13 nests were seen near the east shore of the lake, built in the forks of submerged dead tea-trees (*Melaleuca*) surrounded by rushes. Most of the nests had old birds brooding over them and one contained a young bird.

On June 16 Donald Calderwood and Eric McCrum, on request, made a personal inspection of the site, using a punt belonging to the owner of the property to obtain access to the nests. Altogether 16 nests were found in a row of dead tea-trees in a clear patch of water surrounded by tall rushes. There was usually only one nest in each tree but two trees each had two nests. No other species of cormorants were nesting in the area. The nests were bulky structures made of stieks, some being as much as four feet thick. The egg cavity was a shallow bowl lined with paper bark from the tea-trees. The tops of the nests were from four to seven feet above the surface of the water, but in two instances the elevation was nearer nine feet. Six nests had three fully feathered young birds in each and the remaining ten had two young each.

When the nests were approached the young birds disgorged food at the edges of the nests and then scrambled out giving frightened cries. They were able to swim fairly well. All the while the parents, which had fled at the intrusion, circled overhead. Among the digested fish remains was recognised a parrot fish or "rock cod."

EVIDENCE FROM SPECIMENS

During the past several years, in connection with my investigations on the feeding habits of cormorants, 14 specimens of the Black Cormorant, from various parts of the South-west, have been examined. In each case, at the time of dissection, brief notes were made on the state of the gonads and on the secondary sexual characters. Extracts from these notes are given below, arranged in chronological order.

(a). March 17 (1944): Wilson's Inlet, Denmark.

♀, ova beginning to enlarge. Just completed tail moult.

(b). May 1 (1946): Swan River, Perth.

♂, large testes. Slight development of white thigh patches.

(c). May 1 (1946): Swan River, Perth.

♂, large testes. White thigh patches very prominent.

- (d). June 20 (1937): Leschenault Inlet, Bunbury.
♂, testes very large, 1½ in. long. Prominent white thigh patches; face patch white.
- (e). June 27 (1937): Leschenault Inlet, Bunbury.
♀, ovary active, some ova of pea-size. No white thigh patches; white on face.
- (f). June 29 (1937): Leschenault Inlet, Bunbury.
♂, testes medium to rather large. Thigh patches represented by a few small white feathers; whitish buff face.
- (g). July 7 (1937): Leschenault Inlet, Bunbury.
♂, testes large. Only a very few white filiform feathers on thighs; white face; white filiform feathers scattered on nape, side of neck and sparingly on throat.
- (h). August 19 (1936): Peel Inlet, Mandurah.
♀, ovary active. No white on thighs; light buffy brown on face.
- (i). September 9 (1936): Mandurah.
♀, ovary undeveloped. No white on thighs; buffy white face.
- (j). October 11 (1936): Mandurah.
♀, ovary undeveloped. No white on thighs; buffy white face.
- (k). October 11 (1936): Mandurah.
♀, ovary active. No white on thighs; buffy brown face; breast black mottled with white.
- (l). October 20 (1936): Mandurah.
♂, testes medium. No white on thighs; buffy brown face.
- (m). October 22 (1936): Peel Inlet, Mandurah.
♀, smallish ova. No white on thighs; buffy brown face.
- (n). November 6 (1936): Harvey Estuary.
♂, testes medium, grey. No white on thighs; whitish buff face.

These specimens definitely indicate an autumn and early winter nesting season throughout the South-west. It will be noted that males with white thigh patches were present in the sample only between March and July. Only two males, however, were examined from the latter part of the year, but neither showed white thigh patches.

BREEDING IN THE EASTERN STATES

Mr. N. J. Favaloro (*in litt.*, August 24, 1951) informs me that according to his experience in South-eastern Australia the breeding period is an extended one and varies considerably, depending entirely upon the amount of water and the quantity of food available.

The literature on the subject is scanty. A. J. North (1912, p. 324) quoted an observer at the Upper Clarence River district, N.S.W. as stating that the birds bred there during May and June. Another correspondent at Mossgiel, in south-western N.S.W., informed North that the season was October and November. The egg collections in Australian museums are not extensive for this species. The National Museum of Victoria has eggs from the Clarence River district taken in July (1900) and the South Australian Museum has eggs from the same area in September (1897).

Possibly a greater range of nesting data might indicate two peaks of nesting in the year in normal seasons. Dr. W. Macgillivray (1923, p. 164) has shown that the species will take advantage of exceptional favourable conditions for breeding. He found it nesting, with other water birds, in the Darling River country in late January, 1922, following exceptional floods.

In New Zealand Dr. R. A. Falla (1932, p. 140) states that the Black Cormorant breeds twice a year, laying in May and September.

REFERENCES

- Campbell, A. J., 1901. *Nests and eggs of Australian Birds*.
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FROM FIELD AND STUDY

Brush Bronzewing at Garden Island.—Garden Island is listed as one of the refuges of the Brush Bronzewing (*Phaps elegans*), but as K. Buller failed to observe this declining species during a five-day visit to the island in November, 1948, (*W.A. Nat.*, vol. 2, 1949, p. 48), it may be worth recording a recent occurrence. On February 25, 1955, I found the body of a Brush Bronzewing on the road just below the highest point on the island. It had probably been hit by a car. The bird was not long dead, although part of the head had been destroyed. The rufous nape and bluish under parts were still quite apparent.

—J. A. L. WATSON, Cottesloe.

Golden Whistler (*Pachycephala pectoralis*) as a Fosterer of Pallid Cuckoo (*Cuculus pallidus*).—On November 7, 1954, at Williams I located a young Pallid Cuckoo in a cup nest about 13 ft. from the ground in a Casuarina. The bird scrambled out of the nest, but did not move far and shortly afterwards returned to it. During the ensuing twenty minutes the young cuckoo was fed by: (a) A whistler with apparently striated underparts. (b) A whistler with apparently plain underparts. (c) A cock Golden Whistler in full plumage. (d) A cock Golden Whistler, probably the same as (c). In the two latter occurrences, the bird moved purposefully into the nest and was greeted before arrival by the cuckoo, i.e. the whistler did not appear to be attracted casually.

It seems evident that Golden Whistlers were the true fosterers. This is not one of the fosterers listed in *Birds of W.A.*, Serventy and Whittell, though the bird has been recorded as a fosterer in Tasmania, *vide Birds of Tasmania*, Littler, and may have been recorded elsewhere outside of W.A.

—ERIC H. SEDGWICK, Williams.